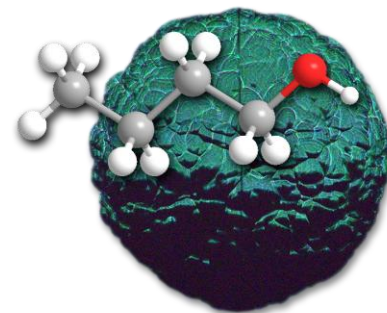




Summary statement: The Combustion-EFRC is focused on the science underlying the combustion and fuel chemistry of non-petroleum-based fuels, especially renewable biofuels, and their development for and optimal use in advanced engines for transportation applications.



RESEARCH PLAN AND DIRECTIONS

- **Challenge:** The combustion characteristics of non-petroleum-based fuels, especially renewable biofuels, in advanced engines are largely unknown.
- **Approaches:** Multidisciplinary study involving quantum chemistry, chemical kinetics, and fluid dynamics relevant to understanding fuel/engine optimization of performance and emissions
- **Unique aspects:** Multi-scale investigation ranging from electronic structure to nanoscale particulate formation to turbulent flame control and emission minimization
- **Outcomes:** Predictive modeling capability to optimize the combustion of renewable transportation fuels in advanced engines